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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,488	05/30/2001	Young Joo Yee	2080-3-20	8736

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EXAMINER

AGUSTIN, PETER VINCENT

ART UNIT PAPER NUMBER

2627

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/871,488		YEE, YOUNG JOO	
	Examiner		Art Unit	
	P. Agustin		2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2005.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-16 and 18-21 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 13-16 and 18-21 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 13-16 & 18-21 are now pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 16, 2005 has been entered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 13 & 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishizaki et al. (US 6,044,041).

In regard to claim 13, Ishizaki et al. disclose an optical pickup head (Figure 4, elements 69, 71 & 72) which makes a fine movement by a driver, and focuses an incident laser beam to a recording medium for recording/reproducing a data, the optical pickup head (Figure 4, elements 69, 71 & 72) comprising: a single micro mirror (69) having at least one approximately 45° mirror surface (note that a 45° mirror surface is necessary to reflect a beam from element 70 to the medium 51 in a perpendicular direction) for reflecting the incident laser beam perpendicular to an incident direction such that only one micro mirror is mounted in the optical head; a focusing

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lens (71) under the micro mirror for primary focusing of the laser beam reflected at the micro mirror; an SIL (Solid Immersion Lens) (72) under the focusing lens for secondary focusing of the laser beam focused by the focusing lens; a supporting frame (inherent structure that holds elements 69, 71 & 72 together) for integrating the micro mirror, the focusing lens and the SIL (Solid Immersion Lens) such that the micro mirror, focusing lens and SIL are held stationary with respect to each other and movement of the supporting frame is controllable by a single driver (not shown, inherent mechanism that drives the SWING ARM of Figure 4); and an air-bearing surface (space between elements 51 & 72) formed under the supporting frame for making the supporting frame buoyant (suggested by “head floating slider” on column 8, line 33; and “floating-type” on column 8, line 43).

In regard to claim 18, Ishizaki et al. disclose that the 45° mirror surface of the micro-mirror, a focus plane of the focusing lens, and a focus plane of the SIL are aligned in parallel (as shown by Figure 4, elements 69, 71 & 72).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 14 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al. in view of Jerman et al. (US 6,061,323).

For a description of Ishizaki et al., see the rejection above. However, Ishizaki et al. are silent: in regard to claim 14, the 45° mirror surface of the micro mirror has a highly reflective

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metal coating applied thereto; and in regard to claim 15, the micro mirror is formed of a silicon substrate.

Jerman et al. disclose a mirror surface having a highly reflective metal coating applied thereto, and formed of a silicon substrate (column 16, lines 53-56). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have provided the highly reflective metal coating of Jerman et al. to the mirror surface of Ishizaki et al., the motivation being to provide a micro-mirror with an improved stiffness/mass ratio for lower mirror distortion, and improved combinations of maximum mirror angular displacement, operating voltage range, mirror stiffness, mirror flatness and resonant frequency (column 3, lines 46-56). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have formed the micro mirror of Ishizaki et al. with a silicon substrate as suggested by Jerman et al., the motivation being to provide a mechanically-rigid micro mirror (a well-known advantage of silicon, see Wilde et al. (US 6,044,056), column 8, lines 16-17).

7. Claims 16 & 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al. & Jerman et al. as applied to claim 15 above, and further in view of Ohashi et al. (US 6,487,224).

For a description of Ishizaki et al. & Jerman et al., see the rejection above. However, Ishizaki et al. & Jerman et al. do not explicitly disclose: in regard to claim 16, that the silicon substrate is a 9.74° off-axis silicon wafer; and in regard to claim 21, that the size of the micro mirror is determined by a pattern size of a front etch mask thin film and a thickness of the off-axis silicon wafer during a photolithography semiconductor fabrication process.

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Ohashi et al. disclose a 9.74° off-axis silicon wafer substrate (column 1, lines 34-56) wherein the size of a micro mirror is determined by a pattern size of a front etch mask thin film and a thickness of the off-axis silicon wafer during a photolithography semiconductor fabrication process (understood from the discussion on column 1, lines 42-60). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have used the 9.74° off-axis silicon wafer of Ohashi et al. for the silicon substrate of Ishizaki et al. & Jerman et al., the motivation being to reduce the number of parts.

8. Claims 19 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al. in view of Mandella (US 6,181,478).

For a description of Ishizaki et al., see the rejection above. Furthermore, in regard to claim 19, Ishizaki et al. inherently disclose that the supporting frame has at least one opening (not shown, hole where element 72 is fitted). However, in regard to claim 19, Ishizaki et al. do not explicitly disclose that the opening comprises a side surface sloped at a fixed angle such that an upper width thereof is greater than a lower width thereof.

Mandella, in the optical recording art (see last three lines of abstract), discloses an opening (see Figure 3B) comprising a side surface (62) sloped at a fixed angle such that an upper width thereof is greater than a lower width thereof. It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have provided the sloped opening of Mandella to the supporting frame of Ishizaki et al., the motivation being to provide an optical system having a small size, and to eliminate misalignment problems (column 2, lines 57-65).

In regard to claim 20, Ishizaki et al. disclose that the SIL (Figure 4, element 72) is fitted in the at least one opening of the supporting frame.

Response to Arguments

9. Applicant's arguments filed November 16, 2005 have been fully considered but they are not persuasive.

On page 5, paragraph 2, the Applicant appears to argue that the Ishizaki et al. reference does not teach the amended feature of claim 1, i.e., "such that only one micro mirror is mounted in the optical pickup head". The Examiner disagrees. The Applicant is directed to lines 5-7 of the abstract of Ishizaki et al., which teaches that "a slider and a head are secured to the tip of a swing arm". This "head" corresponds to the combination of elements 69, 71 & 72 on Figure 4, which clearly comprises a micro mirror 69, a focusing lens 71, and an SIL 72, as recited in claim 13. Note that the mirror 70 is not read to be a part of the claimed "head" since it is provided at the pivot of the swing arm (see column 6, lines 56-57). Therefore, Ishizaki et al. teach that "only one micro mirror is mounted in the optical pickup head".

Conclusion

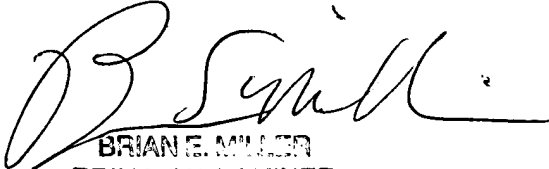
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to P. Agustin whose telephone number is 571-272-7567. The examiner can normally be reached on Monday-Friday 9:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A. L. Wellington can be reached on 571-272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

P. Agustin
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BRIAN E. MILLER
PRIMARY EXAMINER